

PATENT COOPERATION TREATY

PCT

REC'D 17 JUN 2002

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 99097CIP/MBL	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US01/00386	International filing date (day/month/year) 05 JANUARY 2001	Priority date (day/month/year) 07 JANUARY 2000
International Patent Classification (IPC) or national classification and IPC Please See Supplemental Sheet.		
Applicant CAEOT CORPORATION		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 907 of the Administrative Instructions under the PCT).

These annexes consist of a total of 0 sheets.

3. This report contains indications relating to the following items:

I ☒ Basis of the report

II ☐ Priority

III ☐ Non-establishment of report with regard to novelty, inventive step or industrial applicability

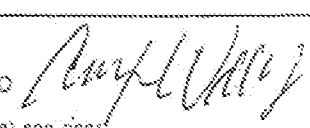
IV ☐ Lack of unity of invention

V ☒ Reasoned statement under Article 35(3) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

VI ☒ Certain documents cited

VII ☐ Certain defects in the international application

VIII ☒ Certain observations on the international application

Date of submission of the demand 02 AUGUST 2001	Date of completion of this report 23 MAY 2002
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer CALLIE SHOSHO 
Facsimile No. (703) 305-3230	Telephone No. (703) 305-0681

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US91/00380

I. Basis of the report

1. With regard to the elements of the international application:*

☒ the international application as originally filed☒ the description:

pages 1-19, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of

☒ the claims:

pages 20-23, as originally filed
pages NONE, as amended (together with any statement) under Article 19
pages NONE, filed with the demand
pages NONE, filed with the letter of

☒ the drawings:

pages NONE, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of

☒ the sequence listing part of the description:

pages NONE, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☒ the description, pages NONE
☒ the claims, Nos. NONE
☒ the drawings, sheets/fig. NONE

5. ☐ This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

**Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US01/00880

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. statement

Novelty (N)	Claims	(Please See supplemental sheet)	YES
	Claims	(Please See supplemental sheet)	NO
Inventive Step (IS)	Claims	(Please See supplemental sheet)	YES
	Claims	(Please See supplemental sheet)	NO
Industrial Applicability (IA)	Claims	(Please See supplemental sheet)	YES
	Claims	(Please See supplemental sheet)	NO

2. citations and explanations (Rule 70.7)

1. Claims 1, 3-9, 21-24, and 28 lack novelty under PCT Article 35(2) as being anticipated by Bruhnke (U.S. 5,768,268).

Bruhnke discloses a method of making a modified pigment, ABXYZ, which comprises reacting a chromophore, A, having attached an electrophilic group, B, such as sulfatoethyl sulfone, with nucleophilic group, X, which is attached to polyoxyalkylene, Y. It is further disclosed that the modified pigment is used in an ink composition (col.2, line 59-col.3, line 15, col.4, line 18, col.4, line 35-col.5, line 25, and col.5, line 10).

2. Claims 1, 3-5, 8-9, 12, 14-15, 20, 30-33, and 35-39 lack novelty under PCT Article 35(2) as being anticipated by Ikeda et al. (U.S. 5,962,429).

Ikeda et al. disclose a method for making a modified pigment comprising reacting a carbon black pigment which comprises an electrophilic functional group with polymer which comprises nucleophilic reactive group. It is disclosed that this product is then further reacted with an additional organic group such as succinic anhydride. The polymers include poly(meth)acrylate and polyalkylene glycol. It is further disclosed that the modified pigment is suitable for use in ink jet ink (col.8, lines 39-36, col.8, line 61-col.9, line 2, col.12, lines 23-40, col.3, lines 36-42, col.6, lines 33-38, col.17, lines 61-62, col.20, lines 17-23, col.20, line 33, col.42, lines 8-16, col.43, lines 39-50, and col.54, lines 39-41).

3. Claims 1-8, 9-9, 12-13, 26-28, and 35-37 lack novelty under PCT Article 35(2) as being anticipated by WO 99/51090.

WO 99/51090 disclose a method of making a modified pigment comprising reacting a pigment having attached chemical group such as benzoic acid which is prepared by reacting a diazonium salt having the chemical group with the pigment to produce a modified pigment which is then reacted with amino-containing polymer such as polyvinyl alcohol or polyacrylate. The pigments include blue, black, brown, red, yellow, etc. pigment including carbon black. It is further disclosed that the modified pigment is suitable (Continued on Supplemental Sheet)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US01/00350

VI. Certain documents cited

1. Certain published documents (Rule 70.10)

<u>Application No. Patent No.</u>	<u>Publication Date (day/month/year)</u>	<u>Filing Date (day/month/year)</u>	<u>Priority date (valid claim) (day/month/year)</u>
US, B1, 6,221,932	24 APRIL 2001	20 OCTOBER 1998	31 JULY 1998
US, B1, 6,235,829	22 MAY 2001	24 JULY 1998	

2. Non-written disclosures (Rule 70.9)

<u>Kind of non-written disclosure</u>	<u>Date of non-written disclosure (day/month/year)</u>	<u>Date of written disclosure referring to non-written disclosure (day/month/year)</u>
---------------------------------------	--	--

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US01/00380

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. Claims 4, 9-11, and 17 are objected to under PCT Rule 56.2(a)(v) as lacking clarity under PCT Article 6 because the claims are indefinite for the following reason(s):

(a) Claims 4, 9, and 17 each recite improper Markush groups. It is advised that in line 2 of each of the claims "or" is inserted after "consisting".

(b) Claim 4 recites that the organic group is selected from "carboxylic acid or esters, acid chlorides, sulfonyl chlorides, ..., and derivatives thereof". The scope of the claim is confusing because it is not clear what compounds are encompassed by the phrase "derivatives thereof". What compounds are considered derivatives?

Similar questions arise in claims 9 and 17 which also recite the phrase "derivatives thereof".

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US01/00880

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 18

CLASSIFICATION:

The International Patent Classification (IPC) and/or the National classification are as listed below:
IPC(7): C09C 1/56, 3/08, 3/10; C09K 3/04; C08L 29/04, 31/02, 33/04, 39/00 and US Cl.: 523/160; 156/31.6, 472, 473, 476; 534/495, 555, 556, 557

V. 1. REASONED STATEMENTS:

The report as to Novelty was positive (YES) with respect to claims 10-11, 25, 29, 35.
The report as to Novelty was negative (NO) with respect to claims 1-9, 12-24, 26-28, 30-34, 36-39.
The report as to Inventive Step was positive (YES) with respect to claims NONE.
The report as to Inventive Step was negative (NO) with respect to claims 1-39.
The report as to Industrial Applicability was positive (YES) with respect to claims 1-39.
The report as to Industrial Applicability was negative (NO) with respect to claims NONE.

V. 2. REASONED STATEMENTS - CITATIONS AND EXPLANATIONS (Continued):

for use in ink jet ink (page 5, line 25-page 6, line 8, page 6, lines 28, page 16, lines 6 and 14-16, page 8, lines 23-27, page 9, lines 25-27, page 10, lines 4-9, page 12, line 35, example 1, and example 8).

4. Claims 1-5, 8-9, 12, and 14-19 lack novelty under PCT Article 33(2) as being anticipated by WO 99/31175.
WO 99/31175 discloses a method of making a modified pigment comprising reacting carbon black pigment which has an attached organic group which has an attached ionic group with at least one polymer which attaches to the ionic group. The polymer includes polyacrylate, the organic group, which is attached by reacting a diazonium salt having the organic group with the pigment, includes aromatic and alkyl group substituted with amine, carboxylic acid, sulfonic acid, phosphonic acid, acrylate, etc., and the ionic group includes anionic or cationic group such as amine, carboxylic acid, sulfonic acid, phosphonic acid, etc. (page 4, line 22, page 5, lines 16-27, page 6, lines 4-28, page 12, line 14-page 13, line 2, and page 16, lines 8-13).
5. Claims 1 and 13 lack novelty under PCT Article 33(2) as being anticipated by Aida et al. (U.S. 5,716,435).
Aida et al. disclose a method of making a modified pigment comprising reacting a pigment having attached electrophilic group with a nucleophilic group. The pigments include magenta, cyan, and yellow pigments (col.5, lines 10-57).
6. Claims 10-11 and 25 lacks an inventive step under PCT Article 33(3) as being obvious over Bruhnke (U.S. 5,766,268) in view of JP 01079279.
The disclosure with respect to Bruhnke in paragraph 1 above is incorporated here by reference.
The difference between Bruhnke and the present claimed invention is the requirement in the claims of specific type of polymer.
JP 01079279 disclose treating pigment with polymer such as polyamine, especially polyethyleneimine, in order to produce an easily dispersible pigment which is excellent in storage stability. It is further disclosed that the pigment is suitable for use in ink (abstract).
In light of the motivation for using specific type of polymer disclosed by JP 01079279 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such polymer in the pigment of Bruhnke in order to produce easily dispersible pigment which is excellent in storage stability, and thereby arrive at the claimed invention.
7. Claims 10-11 and 29 lack an inventive step under PCT Article 33(3) as being obvious over WO 99/51690 in view of JP 01079279.
The disclosure with respect to WO 99/51690 in paragraph 3 above is incorporated here by reference.
The difference between WO 99/51690 and the present claimed invention is the requirement in the claims of specific type of polymer.
JP 01079279 disclose treating pigment with polymer such as polyamine, especially polyethyleneimine, in order to produce an easily dispersible pigment which is excellent in storage stability. It is further disclosed that the pigment is suitable for use in ink (abstract).
In light of the motivation for using specific type of polymer disclosed by JP 01079279 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such polymer in the pigment of WO 99/51690 in order to produce an easily dispersible pigment which is excellent in storage stability, and improved bleed control, and thereby arrive at the claimed invention.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US01/00380

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 11

8. Claim 35 lacks an inventive step under PCT Article 33(3) as being obvious over Bruhnke (U.S. 5,766,268). The disclosure with respect to Bruhnke in paragraph 1 above is incorporated here by reference. The difference between Bruhnke and the present claimed invention is the requirement in the claims of using the modified pigment in ink jet ink. Bruhnke discloses that the modified pigment is suitable for use in ink (col.6, line 9-10), but does not explicitly disclose the use of ink jet ink. However, it would have been within the skill level of one of ordinary skill in the art to recognize that the broad disclosure of ink by Bruhnke encompasses all types of ink including ink jet ink. Therefore, it would have been obvious to one of ordinary skill in the art to use the modified pigment of Bruhnke in any type of ink, including ink jet ink, and thereby arrive at the claimed invention.
9. Claims 1-39 meet the criteria set out in PCT Article 33(4), because the invention has industrial applicability in inks and further, the modified pigment has industrial applicability in not only inks, but also paints, toners, etc.

NEW CITATIONS

US 5,766,268 A (BRUHNKE) 16 JUNE 1998, see col.2, line 59-col.3, line 15, col.4, line 18, col.4, line 45-col.5, line 28, and col.6, line 10).

US 5,952,429 A (IKEDA et al.) 14 SEPTEMBER 1999, see col.8, lines 29-36, col.8, line 61-col.9, line 2, col.12, lines 23-40, col.3, lines 36-42, col.6, lines 33-38, col.17, lines 31-62, col.20, lines 17-23, col.30, line 29, col.42, lines 6-15, col.43, lines 49-50, and col.54, lines 39-41).

WO 99/31175 A (COOKE et al.) 24 JUNE 1999, see page 4, line 22, page 5, lines 16-27, page 6, lines 4-28, page 12, line 14-page 13, line 2, and page 16, lines 8-13).

US 5,716,435 A (AIDA et al.) 10 FEBRUARY 1998, see col.5, lines 10-57.

JP 01079279 A (IZUMIBAYASHI et al.) 24 MARCH 1989, see abstract.